African Invertebrates Vol. 42 Pages 95–104 Pietermaritzburg December, 2001

A review of the South African species of *Corononcodes* Speiser (Diptera: Acroceridae)

by

D. A. Barraclough

(Natal Museum, P. Bag 9070, Pietermaritzburg 3200, South Africa, and School of Botany & Zoology, University of Natal, Pietermaritzburg; dbarracl@nmsa.org.za)

ABSTRACT

The Southern African fauna of Panopinae is reviewed. The South African species of *Corononcodes* Speiser, a genus currently restricted to South Africa and the Mediterranean area, is discussed. The distinction between the South African and the Mediterranean species is reviewed. *Corononcodes* is distinguished by means of a diagnosis from the other afrotropical panopine genera. A key to the South African species of *Corononcodes* is presented; four are currently known: *coronatus* Speiser, 1920 (Northern Cape); *dimorpha* sp. n (Northern Cape); *homalostemma* Barraclough, 1984 (Eastern Cape); and *manningi* sp. n. (KwaZulu-Natal). The two new species are described, with figures of the head profile and wing.

INTRODUCTION

The Panopinae are the most primitive subfamily of Acroceridae, and current host records suggest that they are exclusively parasitoids of trapdoor spiders (Mygalomorphae) (Barraclough 1991; Schlinger 1987). In Southern Africa the subfamily is currently represented by four genera and 14 species: *Astomella* Lamarck (6); *Corononcodes* (4 species, including two new species described below); *Pterodontia* Gray (1); and *Stenopialea* Speiser (3). Three species of these genera are recorded only from other parts of the Afrotropics. These are *Astomella acuta* Schlinger from Tanzania, *Pterodontia aerivaga* Séguy from Ethiopia, and *Stenopialea nyasae* (Brunetti) from Malawi. In addition, *Corononcodes siculus* Bezzi, 1923, is recorded from the southern Palaerctic Region, namely Sicily and the Canary Islands (Frey 1936: 44; Nartshuk 1988: 189; Schlinger 1960: 466), but I believe that this species (or species complex) should be excluded from *Corononcodes*, meaning that the genus is likely to be endemic to Southern Africa. I have examined two males of *Corononcodes* collected at the same locality on Tenerife (Canary Islands) at 2000–2300 m, and both differ from all the South African species in having completely bare eyes, the ocellar tubercle greatly reduced and with the median ocellus absent, and the eyes noticeably dichoptic below the antennae; the South African species always have the eyes partially to fully haired, the ocellar tubercle prominently developed (but if somewhat reduced then with median ocellus present) and the male eyes holoptic. Nevertheless, a comprehensive study of all available *Corononcodes* material from the Mediterranean region is required before final decisions about the generic placement of these species can be made. An interesting point is that according to M. Báez (*pers. comm.*), no mygalomorph spiders are known from the Canary Islands, so it is almost certain that araneomorph spiders are parasitised by "*Corononcodes*" species living on these oceanic islands.

The genus *Corononcodes* is currently known only from four South African species in the Afrotropical Region. It is easily distinguished from other regional genera of Panopinae in having the antennae inserted near the vertex of the head; the other three genera have the antennae inserted well below the vertex. The *Corononcodes* species are small to relatively large acrocerid flies, 4–11 mm in length, all with mainly dark bodies and paler legs, although there may be sexual dimorphism in abdominal colour. Other sexually dimorphic characters noted in the genus are: shorter flagellum in the female; eye pile always present, but variably developed (less in the female); middle section of ocellar tubercle differently developed; abdomen appearing more globular in dorsal view in the female. *Corononcodes dimorpha* sp. n. is unique in having sexually dimorphic wing colour (brownish infuscated in the female and hyaline in the male).

The four known South African species are considerably dissimilar and may not be closely related, which suggests that additional species await discovery, probably in the arid sections of the Eastern Cape, Western Cape, Northern Cape and North-West Provinces. As no host data are available, no further predictions on the distribution of the genus in Southern Africa can be made.

MATERIALS AND METHODS

This study was based on pinned adult flies in the Natal Museum (NMSA) collection. The terminology used in the species key and descriptions is based predominantly on that of McAlpine (1981), Schlinger (1960 1981) and Barraclough (1984).

Bilaterally symmetrical structures are always described in the singular. Measurements of holotypes are given in square parentheses. Holotype label data are quoted exactly as they appear; a slash denotes the end of each line. Significant supplementary or qualifying information is presented in square parentheses when considered necessary.

In the descriptions, the head height *excludes* the ocellar tubercle. The male terminalia of both species described in this paper have not been dissected and illustrated, as there are no other known males in the type series, and I decided not to risk damage to the holotypes. If both sexes of a species were available for description, the male is described first and the distinguishing character states of the female second.

TAXONOMY

Corononcodes Speiser, 1920: 208. Type species: *Corononcodes coronatus* Speiser, 1920, by original designation.

Generic Diagnosis (relative to afrotropical genera of Panopinae): Antenna inserted at or near top of eye (within upper fifth of eye height), just below anterior margin of prominent ocellar tubercle, relatively well developed, either porrect or pendent; male flagellum at most slightly broader than scape and pedicel in profile, typically somewhat tapered apically. Eyes in anterior view usually contiguous (slightly separated in one species) beneath antennal insertion, as far as margin of buccal cavity. Three ocelli usually visible. Eye variably pilose, ranging from a few hairs evident at upper extremity to hairs covering almost entire surface. Lower calypter moderately to well developed, surface area less than (usually) or subequal to that of scutellar disc; sometimes haired along outer margin. Hind tibial spur present, variously developed, either single and talon-like or a row of small sharply pointed projections. Wing with reduced venation, with only r-m crossvein variably developed at mid-length; basal radial, basal medial, posterior cubital, r_{4+5} and m_3 cells not developed, no cells closed before wing margin, vein M_2 present. Female terminalia positioned towards apex of abdominal venter, sternites well developed and not anteroventrally displaced.

Key to the South African species of *Corononcodes* Speiser

1 Ocellar tubercle prominently developed, height about half to three-fifths that of head. Gena conspicuous in profile, depth subequal to length of scape. Lower calypter with dense white pruinosity covering entire surface. Wing with vein R_{4+5} reaching margin [eastern Northern Cape] .... **coronatus** Speiser, 1920

- Ocellar tubercle less strongly developed, height about one-fifth to one-quarter that of head. Gena ranging from barely visible to fairly prominent in profile, depth at most two-thirds length of scape. Lower calypter either without white pruinosity or this broadly present on outer margin only. Wing vein R_{4+5} not reaching margin 2

2 Eye with pile reduced in both sexes, length of vertical band of hairs at dorsomedial extremity at most 1.5 times width of scape apex. Gena barely visible in profile. Male flagellum noticeably shorter than eye depth in profile [Eastern Cape] .... **homalostemma** Barraclough, 1984

- Eye with pile over entire surface of eye or restricted to a vertical band of hairs at dorsomedial extremity, with length of band about 3.0 times width of scape apex. Gena slightly to fairly prominent in profile. Male flagellum noticeably longer than eye depth in profile 3

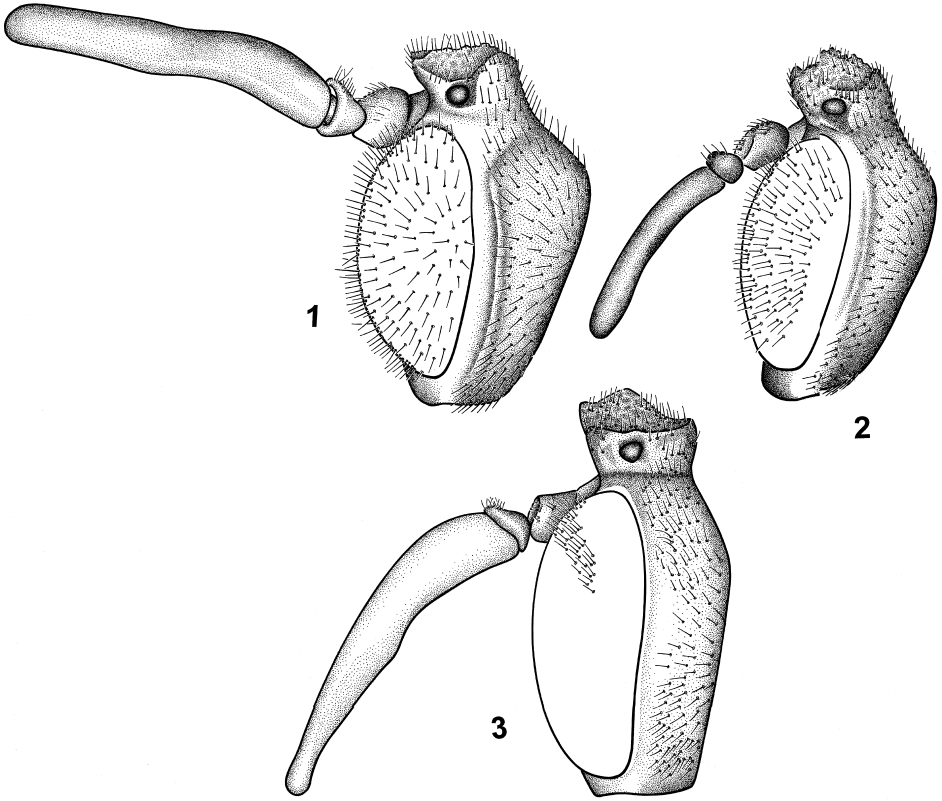
3 Eye with pile covering virtually entire surface; pile on eye and occiput yellow to pale brown (Figs 1 & 2). Gena fairly prominent in profile, depth 0.5–0.7 times length of scape (Figs 1 & 2). Proepisternum haired ventrally. Scutal region between postalar calli and anterior to scutoscutellar suture haired. Wing veins mainly medium to dark brown. Vein M_3 incomplete, not originating from basal crossvein (Figs 4 & 5). Lower calypter without pruinosity on upper surface. Haltere knob medium brown. Tibial spur comprising row of 7–10 tooth-like projections, with one better developed than the others [western Northern Cape] .... **dimorpha** sp. n.

- Eye with pile restricted to a vertical band of hairs at dorsomedial extremity, length of band more than 3.0 times width of scape apex; pile on eye and occiput white (Fig. 3). Gena slightly visible in profile, depth 0.2–0.3 times length of scape (Fig. 3). Proepisternum bare ventrally. Scutal region between postalar calli and anterior to scutoscutellar suture bare. Wing veins mainly cream. Vein M_3 complete, originating from basal crossvein (Fig. 6). Lower calypter with white pruinosity on outer margin of upper surface. Haltere knob white or pale yellow. Tibial spur comprising mainly a single, large, hook-like structure [KwaZulu-Natal Drakensberg] .... **manningi** sp. n.

Corononcodes coronatus Speiser, 1920

Corononcodes coronatus Speiser, 1920; Schlinger, 1980: 377; Barraclough, 1984: 52.

Holotype female: SOUTH AFRICA: *Northern Cape*: 'Kimberley [28°45'S:24°46'E] / Capland / Dr. Brauns. / 6. 09' [date written vertically on righthand side of label]; *Corononco- / des / coronatus* / Speiser / Type' [black ink on red card]; '*Corononcodes / coronatus* / P. Speiser det. / Type'; '*Corononcodes / coronatus* Speis / Type 57'. [red ink on white card]. In NMSA; in poor condition, entire body glued to card, abdomen detached and glued down with ventral-side up, right hind leg missing and left wing badly torn.



Figs 1–3. *Corononcodes* species, head profiles, showing details of all vestiture (note eye pile). 1. *C. dimorpha* sp. n., male. 2. *C. dimorpha* sp. n., female. 3. *C. manningi* sp. n., male.

Redescription: Based on female holotype.

Female:

Measurements (in mm): Total length, excluding antennae [*ca.* 10.8]; wing, from extreme base [7.9].

Head: Eyes and occiput blackish; occiput not visible in dorsal view. Eye with pile restricted to a vertical band of hairs at dorsomedial extremity, length of band about 3–4 times width of scape apex; pile on eye and occiput white. Ocellar tubercle height half to three-fifths head-height; pile elongate, white; ocelli barely visible although apparently 2 present (median ocellus possibly concealed beneath debris), colour brown; ocellar tubercle variously rugose, middle section prominently raised and U-shaped posteriorly where it is markedly higher than anterior margin of this section, height of middle section reaching almost three-fifths total height of tubercle, lower lateral and posterior section with paired and posteriorly directed posterior projections barely evident in dorsal view. Scape and pedicel dark brown; scape bare dorsally; pedicel about half length of scape, with short dorsal hairs; pile on pedicel much less than half length of that on eye, occiput and ocellar tubercle. Flagellum sharply pointed apically; entirely dark brown; length about 0.8–0.9 times height of eye. Epistomal region relatively well developed and protruding anteriorly. Gena well developed in profile, depth subequal to length of scape. Proboscidial covering and buccal cavity apparently brown.

Thorax: Entirely dark brown to black, pleura slightly paler. Pile white; absent below anepisternum, anepimeron and katatergite, also absent from upper anterior margin of anepisternum, extreme lateral corners of scutellum and from lower half of proepisternum; pile length almost reaching 2.0 times as long as on head. Pro- and metathoracic spiracles yellow. Halteres detached.

Legs: Coxae mainly medium to dark brown (paler brown on posterior surfaces), pile white and slightly shorter than head pile, pile sparse on posterior surfaces of fore and mid coxae and largely absent on posterior surface of hind coxa. Trochanters brown to yellow-brown, pile white and shorter than coxal pile, present on anterior and posterior surfaces of all trochanters. Femora mainly yellow-brown, pile white, at most half as long as head pile, sparse to absent on posterior surfaces. Tibiae yellow-brown, pile white, shorter and sparser than femoral pile; spurs well developed, comprising talon-like projection, hind spur 1.5 times length of scape. Tarsi yellow to brown, pile shorter than tibial pile, but slightly longer dorsally at apex of each segment, pile not markedly elongate dorsally at apex of fifth segment. Claws dark brown to black; pulvilli yellow to yellow-brown.

Wing: Membrane hyaline. Veins yellow to pale brown, but costa and subcosta darker brown. Vein M_3 complete, originating from basal crossvein. Vein R_{4+5} reaching wing margin. Upper calypter entirely white pruinose. Lower calypter entirely white pruinose; pile completely absent.

Abdomen: Widest at TII. Mainly dark brown (although dorsum much fragmented). Pile white, apparently short, but much abraded.

Male: Unknown.

Discussion: This species is known only from the badly damaged female holotype. It is the largest South African species in the genus, and has the most prominently developed ocellar tubercle (see Barraclough 1984: Figs 23 & 24). The holotype (collected by Dr Brauns) was original deposited in the Transvaal Museum, but was transferred in 1983, together with most of the Transvaal Museum's Diptera collection, to the Natal Museum.

In his original description, Speiser erroneously stated that the holotype was a male; this error was pointed out by Schlinger (1960: 466). Speiser also erroneously stated that the eyes were bare, whereas eye pile is certainly present, albeit restricted to a vertical band of hairs at the dorsomedial extremity of the eye.

Corononcodes dimorpha sp. n.

(Figs 1–2, 4–5)

Etymology: Named for the sexual dimorphism in wing colour.

Holotype male: SOUTH AFRICA: *Northern Cape*: 'SOUTH AFRICA / Garies [30°33'S:17°59'E] / Sept. 1970 / H. Townes'; 'HOLOTYPE male / *Corononcodes* / *dimorpha* sp. n. / Det. D. Barraclough, 2001'. In NMSA; in good condition.

Description: Based on male holotype and female paratype (same data as holotype).

Male:

Measurements (in mm): Total length, excluding antennae [7.2]; wing, from extreme base [4.9].

Head (Fig. 1): Eyes and occiput blackish; occiput visible in dorsal view. Eye with pile covering full extent in profile (although absent antero-medially); pile on eye and occiput pale brown. Ocellar tubercle height one-fifth head-height; pile elongate, white; 3 ocelli, all yellow-brown, median ocellus about one-fifth size of lateral ocellus; ocellar tubercle variously rugose with 2 sublateral vertical ridges on anterior half, middle section not raised, paired and dorsally directed posterior projections in dorsal view. Scape and pedicel mainly dark brown; scape haired dorsally; pedicel a little longer than half length of scape, with short dorsal hairs; pile on scape and pedicel less than half length of that on eye, occiput and ocellar tubercle. Flagellum smoothly rounded apically; partly yellow-brown, otherwise dark brown (mostly dorsally); length about 1.3–1.4 times height of eye. Epistomal region reduced, slightly protruding anteriorly. Gena moderately developed in profile, depth at most two-thirds length of scape. Proboscidial covering dark brown; buccal cavity brown.

Thorax: Dark brown to black, pleura slightly paler. Pile white or pale yellow; absent below anepisternum, anepimeron and katatergite, also absent from entire anterior margin of anepisternum, extreme lateral corners of scutellum and from lower half of proepisternum; pile length almost reaching 2.0 times as long as on head. Pro- and metathoracic spiracles yellow. Haltere medium brown.

Legs: Coxae mainly medium to dark brown, pile white and slightly shorter than head pile, pile sparse on posterior surfaces of fore and mid coxae and largely absent on posterior surface of hind coxa. Trochanters mainly yellow-brown, pile white or yellow and shorter than coxal pile, very sparse on fore and mid trochanters and present on anterior surface of hind trochanter. Femora mainly yellow but brown anteroventrally, pile white and half to two-thirds as long as head pile, sparse to absent on posterior surfaces. Tibiae yellow, pile white, shorter and sparser than femoral pile; spurs weakly developed, comprising row of 7–10 tooth-like projections with one better developed than others, hind spur less than half length of scape. Tarsi yellow, pile shorter than tibial pile, but slightly longer dorsally at apex of each segment, pile markedly elongate dorsally at apex of fifth segment with length here almost reaching that of head pile. Claws dark brown to black; pulvilli yellow to yellow-brown.

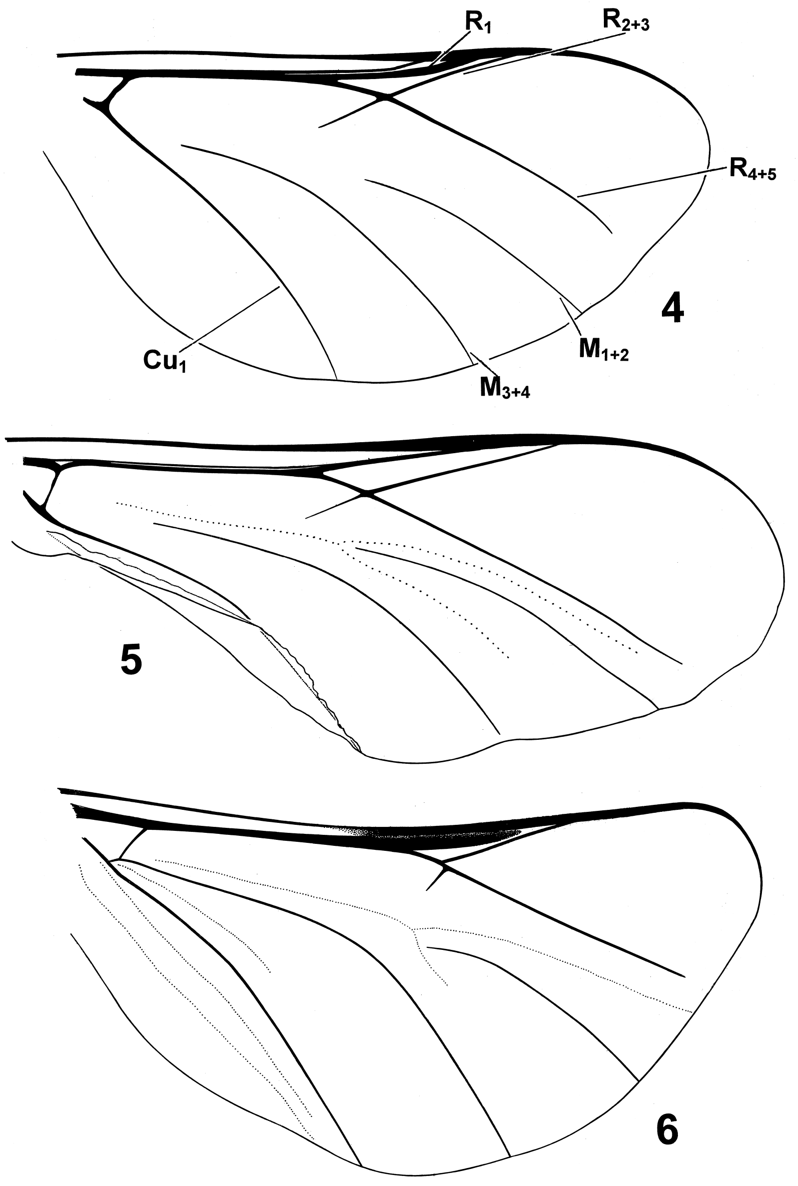
Wing (Fig. 4): Membrane hyaline. Veins mostly medium to dark brown, but subcosta mainly yellow-brown to brown. Vein M_3 incomplete, not originating from basal crossvein. Vein R_{4+5} not reaching wing margin. Upper calypter entirely white pruinose. Lower calypter entirely hyaline; pile short, along outer margin.

Abdomen: Widest at TII. Mainly dark brown. Pile white, shorter than thoracic pile, more profuse on sternites, here sometimes appearing yellow.

Female:

Measurements (in mm): Total length, excluding antennae [7.3]; wing, from extreme base [6.1].

Head (Fig. 2): Ocellar tubercle height one-quarter head height; pile yellow, absent posteriorly in profile; middle section conspicuously raised above lateral regions, height



Figs 4–6. *Corononcodes* species, wing, showing shape and venation. 4. *C. dimorpha* sp. n., male. 5. *C. dimorpha* sp. n., female (note: anal region folded upwards). 6. *C. manningi* sp. n., male.

almost twice lateral margins. Flagellum entirely dark brown to black; length about 0.8–0.9 times height of eye.

Legs: Fore coxa mainly yellow-brown. Pile present on anterior surface of each trochanter. Tibiae pale to medium brown. Spur comprising row of 7–8 tooth-like projections. Tarsi yellow-brown, pile at apex of fifth segment with length about two-thirds that of head pile.

Wing (Fig. 5): Longer and more slender than in male. Membrane brownish infuscated. Upper calypter entirely brown pruinose.

Abdomen: Widest at TIII or TIV. Pile yellow to brown.

Discussion: A notable character of this species is the sexual dimorphism in wing colour, the membrane being entirely hyaline in the male and brownish infuscated in the female. The female also has the middle section of the ocellar tubercle more conspicuously elevated than in the male. As in *C. homalostemma* the flagellum is shorter in the female. It is the only South African *Corononcodes* species to have vein M_3 obviously incomplete and not attached to the basal crossvein.

Corononcodes dimorpha has been collected only at Garies, in Upland Succulent Karoo, near the west coast of the Northern Cape. The type series was kindly donated to the Natal Museum by Dr H. Geertsema of the University of Stellenbosch.

Corononcodes homalostemma Barraclough, 1984

Corononcodes homalostemma Barraclough, 1984: 52.

Discussion: This species is still known only from the type series from Belmont Valley, Grahamstown (Eastern Cape). The holotype, nine male and 4 female paratypes were collected in a Malaise trap.

The characteristic head profile and wing venation of this species were illustrated by Barraclough (1984: Figs 25 & 27). Although diificult to discern, pile is present at the dorsomedial extremity of the eye in both sexes. The ocellar tubercle clearly has three ocelli.

Corononcodes manningi sp. n.

(Figs 3, 6)

Etymology: Named for Dr J. Manning, collector of the unique holotype.

Holotype male: SOUTH AFRICA: *KwaZulu-Natal*: ‘REP. SOUTH AFRICA, NATAL / GARDEN CASTLE FOREST / RESERVE [29°45'S:29°15'E] / 13.II.82 / J. MANNING’; ‘DAMP GRASSLAND / NEAR STREAM’; ‘HOLOTYPE male / *Corononcodes* / *manningi* sp. n. / Det.: D. Barraclough, 2001’. In NMSA; in good condition.

Description: Based on male holotype.

Measurements (in mm): Total length, excluding antennae [6.0]; wing, from extreme base [4.5].

Head (Fig. 3): Eyes and occiput blackish; occiput visible in dorsal view. Eye with pile restricted to a vertical band of hairs at dorsomedial extremity, length of band more than 3.0 times width of scape apex; pile on eye and occiput white. Ocellar tubercle height one-third head-height; pile elongate, white; 3 ocelli, dark yellow, median ocellus less than half size of lateral ocellus; ocellar tubercle rugose, markedly excavate on either side of raised middle section, height of middle section twice that of lateral sections, lower lateral and posterior section with paired sharp, posterior projections in dorsal view. Scape and pedicel dark brown; scape bare dorsally; pedicel a little longer than half length of scape, with short dorsal hairs;

pile on scape and pedicel less than half length of that on eye, occiput and ocellar tubercle. Flagellum smoothly rounded apically; partly yellow-brown, otherwise dark brown (mostly dorsally); length about 1.3 times height of eye. Epistomal region reduced, not protruding anteriorly. Gena slightly developed in profile, depth at most two-fifths length of scape. Proboscidial covering dark brown; buccal cavity yellow-brown to brown.

Thorax: Dark brown to black. Pile white; absent below anepisternum, anepimeron and katatergite, also absent from entire anterior margin of anepisternum, extreme lateral corners of scutellum and from scutal region between postalar calli and anterior to scutoscutellar suture; pile length almost 2.0 times as long as on head. Pro- and metathoracic spiracles yellow. Haltere dark cream to yellow.

Legs: Coxae mainly brown, pile white and subequal in length to head pile, pile sparse on posterior surfaces of fore and mid coxae and largely absent on posterior surface of hind coxa. Trochanters mainly dark brown, pile white and shorter than coxal pile, present on anterior and posterior surfaces. Femora mainly yellow-brown but darker brown anteroventrally, pile white, half to two-thirds as long as head pile, sparse to absent on posterior surfaces. Tibiae yellow-brown, pile white, shorter and sparser than femoral pile and sparse to absent on posterior surfaces; spurs moderately developed, comprising a curved and hook-like structure, hind spur about three-fifths length of scape. Tarsi yellow or yellow-brown, pile shorter than tibial pile, but longer dorsally at apex of each segment, pile markedly elongate dorsally at apex of fifth segment with length here almost reaching that of head pile. Claws dark brown to black; pulvilli yellow to yellow-brown.

Wing (Fig. 6): Membrane hyaline. Veins mostly cream, but subcosta mainly yellow-brown to brown. Vein M_3 complete, originating from basal crossvein. Vein R_{4+5} not reaching wing margin. Upper calypter entirely white pruinose. Lower calypter partly hyaline, otherwise conspicuously white pruinose on outer margin; pile absent.

Abdomen: Widest at TII. Mainly dark brown, but posterior margins of TI to TIII noticeably paler (cream to yellow-brown). Pile white, slightly shorter than thoracic pile, somewhat more profuse on sternites.

Discussion: The unique holotype is from the Garden Castle Nature Reserve in the southern KwaZulu-Natal Drakensberg, west of Underberg. The species has no close relatives in the South African fauna. A striking autapomorphy is the bare scutal region between the postalar calli and anterior to the scutoscutellar suture.

ACKNOWLEDGEMENTS

I am indebted to Dr H. Geertsema, Department of Entomology and Nematology, University of Stellenbosch, for the donation of the *Corononcodes dimorpha* type material to the Natal Museum collection. Dr M. Báez (Universidad de la Laguna, Tenerife, Canary Islands) kindly loaned me two Tenerife specimens of *Corononcodes*. Shayleen James (Arthropoda Department, Natal Museum) is thanked for the skilful execution of all the artwork in this paper. Drs B. Stuckenberg and E. Schlinger kindly reviewed an earlier draft of this paper. The National Research Foundation is thanked for financial support in 2000.

REFERENCES

Barraclough, D. A. 1984. Review of some Afrotropical Acroceridae, with descriptions of eight new species from South Africa (Diptera: Brachycera). *Journal of the Entomological Society of Southern Africa* **47** (1): 45–66.

——— 1991. A review of the genus *Astomella* Lamarck in southern Africa, with the description of two new species (Diptera: Acroceridae: Panopinae). *Journal of the Entomological Society of Southern Africa* **54** (2): 163–172.

Frey, R. 1936. Die Dipterenfauna der Kanarischen Inseln und ihre Probleme. *Commentationes Biologicae* **6** (1): 1–237.

McAlpine, J. F. 1981. Morphology and terminology – adults. *In*: McAlpine, J. F., *et al.*, *Manual of Nearctic Diptera*. Vol. 1. Hull (Quebec): Agriculture Canada, Research Branch. (Monograph; No. 27) pp. 9–63.

Nartshuk, E. P. 1988. Family Acroceridae. *In*: Soós, Á & Papp, L., eds., *Catalogue of Palaearctic Diptera, Volume 5, Athericidae–Asilidae*. Amsterdam: Elsevier pp. 186–196.

Schlinger, E. I. 1960. A review of the South African Acroceridae (Diptera). *Annals of the Natal Museum* **14**: 459–504.

——— 1980. 30. Family Acroceridae. *In*: Crosskey, R. W., ed., *Catalogue of the Diptera of the Afrotropical Region*. London: British Museum (Natural History) pp. 377–380.

——— 1981. Acroceridae 43. *In*: McAlpine, J. F., *et al.*, *Manual of Nearctic Diptera*. Vol. 1. Hull (Quebec): Agriculture Canada, Research Branch. (Monograph; No. 27) pp. 575–584.

——— 1987. The biology of Acroceridae (Diptera): true endoparasitoids of spiders. *In*: Nentwig, W., ed., *Ecophysiology of spiders*. Berlin: Springer-Verlag pp. 319–327c.

Speiser, P. 1920. Zur Kenntnis der Diptera Orthorrhapha Brachycera. *Zoologische Jahrbücher Abteilung für Systematik* **43**: 195–220.